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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,891	08/20/2001	Jens Sauerbrey	L&L-10050	6815

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EXAMINER
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CHEN, TSE W

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 06/23/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/932,891

Applicant(s)

SAUERBREY ET AL.

Examiner

Tse Chen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-21 and 24-27 is/are rejected.
- 7) ☒ Claim(s) 6-10, 22 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on September 18, 2001 was filed before the mailing date of the first Office Action. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Specification***

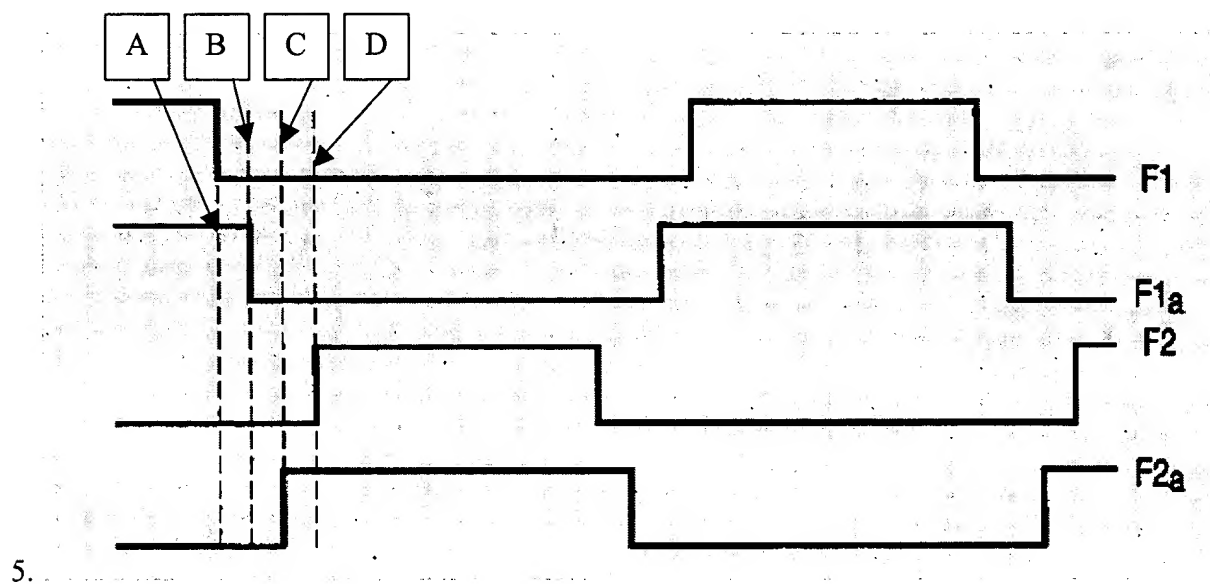
2. Claims 1 and 15-16 are objected to because of the following informalities:
  - 2.1. As per claims 1 and 15-16, “said at least two non-overlapping switching-clock signals...” and “said clock generator...” correspond incorrectly to the circuit configuration in the preamble.
  - 2.2. As per claim 16, “a means for generating at least two non-overlapping ... each having *and* on-phase...” should be corrected to “... each having *an* on-phase” and “said clock generator means” and “said phase-variance means” should be modified to correspond better with respected antecedents.

Appropriate correction is required.

3. The following are fact findings supporting the rejection of claims 1 and 15-17:

### ***Findings***

4. Baschiroto et al., U.S. Patent 5745002, hereinafter Baschiroto, discloses:



5.

- 5.1. A circuit configuration in switched op-amp technology [fig.9; col.4, ll.21-23].
- 5.2. The circuit configuration comprising at least one switchable operational amplifier [A2] having an input [S4] and an output [VO] [fig.4].
- 5.3. The circuit configuration comprising at least one sampling capacitor [switched or sampling capacitance C1] connected to said input.
- 5.4. The circuit configuration comprising at least one integrating capacitor [feedback capacitance C2] connected to said input and to said output.
- 5.5. The circuit configuration comprising a clock generator [inherently, there is a clock generator, *in the broadest interpretation*, to produce the signals] producing at least two non-overlapping switching-clock signals [fig.5, F1 and F2].
- 5.6. Each clock signal having switching-clock phases including an on-phase and an off-phase [col.8, ll.1-8, 1.60 – col.9, 1.14].
- 5.7. Said at least two non-overlapping switching-clock signals including a first switching-clock signal [F1] and a second switching-clock signal [F2].

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- 5.8. Said clock generator controlling charging of said sampling capacitor with said first switching-clock signal [col.9, ll.7-10] and switching said operational amplifier on and off with said second switching-clock signal [col.9, ll.10-14; controls on/off of output].
- 5.9. The circuit configuration comprising a phase-variance device [fig.5; inherently, there is a phase-variance device, *in the broadest interpretation*, to output the different phases] varying said switching-clock phases in which said first and second switching-clock signals are in said off-phase [col.8, ll.1-5; suitably delaying or varying the phases].
- 5.10. A circuit configuration [fig.8] in fully differential circuit technology [col.4, ll.1-15; the signal lines and voltage settings of the circuit configuration of fig.4 may also be set accordingly to derive the fully differential configuration].
- 5.11. A method for clocking successive operation amplifier stages [fig.9; op-amp 1, 2, and 3 form successive stages] constructed in switched op-amp technology [col.4, ll.21-23].
- 5.12. The method comprising generating at least two non-overlapping switching-clock signals [F1a and F2a] [fig.5; col.8, ll.1-8, l.60 – col.9, l.14].
- 5.13. The method comprising switching a first operational amplifier [A1] on and off with a first signal [F1a] of the two switching-clock signals [col.9, ll.40-44].
- 5.14. The method comprising switching a second operational amplifier [A2] on and off with a second signal [F2a] of the switching-clock signals [col.9, ll.58-62].
- 5.15. The method comprising varying switching-clock phases in which the operational amplifiers are switched off [col.8, ll.1-5; suitably delaying or varying the phases].
6. Fletcher, U.S. Patent 6392466, discloses:

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- 6.1. A circuit configuration [cache 700; fig.3] in switched amplifier [sense amplifier 620] technology [fig.5; col.3, l.46 – col.4, l.2].
- 6.2. The circuit configuration comprising a clock generator [703].
- 6.3. The circuit configuration comprising a phase-variance device [controllable pulse clock delay block 790] varying said switching-clock phases in which the first and second switching-clock signals are in off-phase [fig.6; col.21, l.19 – col.22, l.5; control signals enable phase two to be off-phase relative to phase one].
- 6.4. Said phase-variance device connected to said clock generator [fig.3].
- 6.5. The advantage of utilizing phase variance in circuits is reduction in power consumption [col.8, ll.41-65; pulse clock delay arrangement varies phase and thus, produces a pulse with suitable width to save processing time which saves power].

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Re Claims 17-21 and 24***

8. Claims 17-21 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Baschiroto.
9. In re claim 17, Bashiroto discloses each and every claimed limitation as set forth in findings 5.11-5.15.
10. As to claim 18, Baschiroto discloses the method comprising:

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10.1. Varying each of the switching-clock phases in which the operational amplifiers are switched off [finding 5.15; in fig.5 reproduced above, both switching-clock phases of F1a and F2a are varied resulting in both clock signals being in the off-phase in the interval between B and C].

11. As to claim 19, Baschiroto discloses the method comprising:

11.1. Varying each second one of the switching-clock phases in which the operational amplifiers are switched off [in fig.5 reproduced above, phase of F2 is varied resulting in F1 and F2 being in off-phase in the interval between A and D].

12. As to claim 20, Baschiroto discloses the method comprising:

12.1. Varying a duration of the switching-clock phases in which the operational amplifiers are switched off dependent on a transient response of the operational amplifiers [col.7, 1.62 – col.8, 1.5; anticipating the switching function to control the negative spikes suggests utilization of knowledge of transient response in order to derive appropriate timing].

13. As to claim 21, Baschiroto discloses the method comprising:

13.1. Varying a duration of the switching-clock phases in which the operational amplifiers are switched off dependent on a switching speed of transistors of the operational amplifiers [fig.10; col.7, 1.6 – col.8, 1.5; anticipating the switching function to control the negative spikes suggests utilization of knowledge of switching speed of the transistors in order to derive appropriate timing].

14. As to claim 24, Baschiroto discloses the method comprising:

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14.1. Adjusting a duration of the switching-clock phases in which the operational amplifiers are switched off in a number of predetermined steps [col.7, l.62 – col.8, l.5; anticipating the switching function to control the negative spikes suggests a method comprising a number of predetermined steps such as taking in the current relevant values of clock, voltage, etc., comparing the values to some predetermined value, and then act accordingly in order to derive appropriate timing].

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Re Claims 1-5, 11-12, and 15-16***

16. Claims 1-5, 11-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baschiroto in view of Fletcher.

17. In re claim 1, Baschiroto discloses each and every limitation of the claim [findings 5.1-5.9], except the explicit details of phase-variance device. Fletcher teaches a circuit configuration in switched amplifier, comprising a clock generator connected to a phase-variance device for varying the switching-clock phases in which the first and second switching-clock signals are in off-phase [findings 6.1-6.4], in order to reduce power consumption [finding 6.5]. It would have been obvious to one of ordinary skill in the art, having the teachings of Baschiroto and Fletcher before him at the time the invention was made, to use the phase-variance device taught by Fletcher for the circuit configuration disclosed by Baschiroto as the phase-variance



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device taught by Fletcher is suitable for use as the phase-variance device of Baschiroto. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to reduce power consumption.

18. As to claim 2, Baschiroto discloses the circuit configuration wherein:

18.1. The phase-variance device is configured to vary each of said switching-clock phases in which the first and second switching-clock signals are in the off-phase [finding 5.9; in fig.5 reproduced above, both switching-clock phases of F1a and F2a are varied resulting in both clock signals being in the off-phase in the interval between B and C].

19. As to claim 3, Baschiroto discloses the circuit configuration wherein:

19.1. The phase-variance device is configured to vary each second one of the switching-clock phases in which the first and second switching-clock signals are in the off-phase [finding 5.9; in fig.5 reproduced above, phase of F2 is varied resulting in F1 and F2 being in off-phase in the interval between A and D].

20. As to claim 4,

20.1. The Examiner hereby takes Official Notice that operational amplifiers have an associated transient response [operational amplifiers are signal control devices that operate on electrical power and thus, have a time duration for output power levels to stabilize].

20.2. Baschiroto discloses the phase-variance device is configured to vary a duration of the switching-clock phases in which the first and second switching-clock signals are in the off-phase dependent upon the transient response of the operational amplifier [col.7, l.62

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– col.8, 1.5; anticipating the switching function to control the negative spikes suggests utilization of knowledge of transient response in order to derive appropriate timing].

21. As to claim 5, Baschiroto discloses the circuit configuration wherein:

21.1. The operational amplifier has transistors [fig.10] having a switching speed [inherently, transistors have associated switching speeds dependent upon their respected dimensions].

21.2. The phase-variance device is configured to vary a duration of the switching-clock phases in which the first and second switching-clock signals are in the off-phase dependent upon said switching speed of the transistors [col.7, 1.6 – col.8, 1.5; anticipating the switching function to control the negative spikes suggests utilization of knowledge of switching speed of the transistors in order to derive appropriate timing].

22. As to claim 11, Baschiroto discloses the circuit configuration wherein:

22.1. The phase-variance device is configured to adjust a duration of the switching-clock phases in which the first and second switching-clock signals are in the off-phase in a given number of predetermined steps [col.7, 1.62 – col.8, 1.5; anticipating the switching function to control the negative spikes suggests a method comprising a number of predetermined steps such as taking in the current relevant values of clock, voltage, etc., comparing the values to some predetermined value, and then act accordingly in order to derive appropriate timing].

23. As to claim 12, Fletcher discloses the circuit configuration wherein:

- 23.1. The clock generator and the phase-variance device are embodied as a programmable clock generator [col.22, ll.6-35; clock generator and phase-variance device may be integrated as a programmable clock generator for each logical unit].
24. As to claim 15, see finding 5.10 and discussion above in reference to claim 1.
25. As to claim 16, see discussion above in reference to claim 1 and the following:
- 25.1. In regards to “a means for generating at least two non-overlapping switching-clock signals each having an on-phase and an off-phase”, see finding 5.5 where the clock generator represents the means.
- 25.2. In regards to “a means for varying switching-clock phases in which said first and second switching-clock signals are in said off-phase”, see finding 5.9 where the phase-variance device represents the means.
- Re Claims 13-14***
26. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baschiroto and Fletcher as applied to claim 1 above, and further in view of Larson, U.S. Patent 4951303.
27. In re claim 13, Baschiroto and Fletcher disclose each and every limitation of the claim, as discussed above in reference to claim 1. Baschiroto and Fletcher did not disclose the embodiment details of the clock generator and the phase-variance device.
28. Larson discloses a circuit configuration comprising a clock generator [square wave generator circuit 20] and a phase variance device [ring oscillator 40] embodied as:
- 28.1. An external squarewave generator [25] producing a squarewave signal [col.2, ll.50-51].
- 28.2. A divider circuit [primarily ring oscillator 40] connected to the squarewave generator, the divider circuit generating the at least two switching-clock signals from the

squarewave signal [col.2, 1.49 – col.3, 1.39; lines 22 and 24 produce the two different phase signals with the output being controlled by terminal 56].

29. It would have been obvious to one of ordinary skill in the art, having the teachings of Larson, Baschiroto and Fletcher before him at the time the invention was made, to use the clock generator and phase-variance device taught by Larson for the circuit configuration disclosed by Baschiroto as the clock generator and phase-variance device taught by Larson is suitable for use in the circuit configuration of Baschiroto. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to reduce power consumption [finding 6.5].

30. As to claim 14, Baschiroto discloses the circuit configuration wherein:

30.1. The squarewave signal has a duty ratio [fig.5; inherently, squarewaves generated have an associated duty ratio with the ideal being 1:1].

30.2. Adjustment of the duty ratio varies the switching-clock phases in which the first and second switching-clock signals are in the off-phase [fig.5 and finding 5.9; the duty ratio of F2 is not an ideal 1:1 and has been adjusted through phase-variance device to result in the off-phase interval as discussed above in reference to claim 3].

#### ***Re Claims 25-27***

31. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baschiroto as applied to claim 17 above, and further in view of Larson.

32. In re claim 25, Baschiroto discloses each and every limitation of the claim, as discussed above in reference to claim 17. Baschiroto did not disclose the details of a specific clock generator for generating the clock signals.

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33. Larson discloses a method for generating clock signals [frequency] [col.1, ll.8-10] with a programmable clock generator [frequency divider 10] [col.2, l.67 – col.3, ll.39; clock generator is programmed through terminal 56 to output appropriate clock signals].

34. It would have been obvious to one of ordinary skill in the art, having the teachings of Larson and Baschiroto before him at the time the invention was made, to use the programmable clock generator taught by Larson in the method disclosed by Baschiroto as the clock generator taught by Larson is suitable for use in the method of Baschiroto to produce the at least two non-overlapping switching-clock signals. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to produce the switching-clock signals.

35. As to claim 26, see discussion above in reference to claim 25. Larson discloses a method for generating clock signals with an external squarewave generator [25] and a divider circuit [primarily ring oscillator 40].

36. As to claim 27, Baschiroto discloses the method comprising:

36.1. Varying the switching-clock phases in which the operational amplifiers are switched off by adjusting a duty ratio of a squarewave signal from the squarewave generator [fig.5 and finding 5.9; the duty ratio of F2 is not an ideal 1:1 and has been adjusted to result in the off-phase interval as discussed above in reference to claim 19].

***Allowable Subject Matter***

37. Claims 6-10 and 22-23 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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38. The following is a statement of reasons for the indication of allowable subject matter: the claims are allowable because none of the references cited, either alone or in combination discloses or renders obvious a circuit configuration as recited in claim 5, with “a detector for detecting the switching speed of the transistors, the detector connected to the operational amplifier” and the method as recited in claim 17, with the step of “separately detecting at least one of a switching speed of n-channel FETs and a switching speed of p-channel FETs”.

***Conclusion***

39. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Liu et al., U.S. Patent 5598326, discloses a device for varying duty ratio.
- Cheung et al., U.S. Patent 6344767, discloses a full differential circuit configuration in switched op-amp technology.
- Yoshizawa, U.S. Patent 6037836, discloses a switched op-amp circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (703) 305-8580. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (703) 308-1159. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tse Chen  
June 20, 2004

  
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